

**BEST AVAILABLE COPY****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE****Applicant:** Landau, Steve**Application No.:** 10 / 706,733**Filed:** November 12, 2003**Title:** System for Guiding Visually Impaired
Pedestrian Using Auditory Cues**Attorney Docket No.:** Touchgraphics-1**Art Unit:** 3661**Examiner:** Michael Zanelli

**DECLARATION OF PRIOR INVENTION
IN THE UNITED STATES OR A WTO MEMBER OR NAFTA COUNTRY
TO OVERCOME CITED PRIOR ART UNDER 35 C.F.R. § 1.131.**

I, STEVEN LANDAU, hereby declare:

1. I am the inventor of the System for Guiding Visually Impaired Pedestrian Using Auditory Cues, described in application 10/706,733.

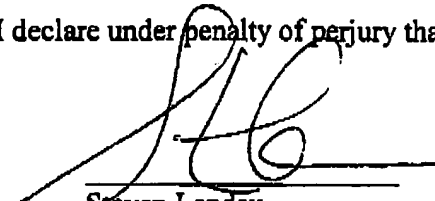
2. The invention claimed by the above-referenced patent application was reduced to practice prior to June 30, 2003.

3. The attached exhibit is the cover sheet and executive summary of a report to a funding agency regarding the results of operating the invention in a test environment, the date of the report is July, 2003.

4. I understand that making willfull false statement before the U.S. P.T.O. is punishable by a fine, imprisonment or both and may jeopardize the validity of the application or any patent issuing thereon.

5. I declare under penalty of perjury that the foregoing is true and correct.

Dated: May 25, 2005


Steven Landau

Submitted to

National Science Foundation

Small Business Innovation Research Phase 1 Grant

Project entitled

**Creating Accessible Science Museums for Blind and
Visually Impaired Visitors with User-Activated Audio
Beacons**



Final Report

Touch Graphics Company
330 West 38 Street Suite 1204
New York, NY 10018

July 2003

Executive Summary

Touch Graphics Company is pleased to submit this *Final Report*, documenting a Phase 1 Small Business Innovation Research Grant carried out between January 2, 2003 and June 30, 2003. The project, entitled, *Creating Accessible Science Museums for Blind and Visually Impaired Visitors with User-Activated Audio Beacons*, focused on conceptualization, implementation and evaluation of a new product that is intended to enhance accessibility to science museums for visitors who are blind, visually impaired or otherwise print disabled.

This *Final Report* includes the following sections:

- *A Project Summary*, taken from the original *Proposal* submitted to the National Science Foundation in June of 2002. The summary sets out the research team's overall ambitions for the project, and describes ways that the proposed research responds to stated objectives in the government program under which funding is provided;
- *Background*, to introduce the Company, describe prior work leading up to the current project, and to acknowledge the collaborators, consultants and sub-contractors who carried out the research;
- *Description of Activities and Products*, which includes a detailed description of the tasks carried out and materials developed in the course of the project;
- *Human Subjects Protection Issue*, to report on the results of the IRB certification process.
- *Evaluator's Report*, in which an independent expert in the field of evaluating museum exhibits provides a description of the user trials, findings and recommendations for future research;
- *Dissemination*, documenting our ongoing efforts to bring the work of this project to the attention of a variety of stakeholder groups.
- *Goals for Future Research*, to outline our plans for Phase 2 and beyond.
- *Appendix*, which includes a transcript of all of the spoken messages created for interacting with users on the phone, data collection instruments from the user trials, and a separate report generated by the sub-contractors at Western Michigan University, documenting their activities and findings related to an investigation into the catalog of Ping sounds.

As revealed in this document, this Phase 1 SBIR undertaking has produced strikingly positive results. We have demonstrated that the envisioned network of wireless user-activated audio beacons is, indeed, feasible, and that it can markedly improve accessibility to science museum exhibits, and by implication, to other complex public spaces, for individuals who are blind or visually impaired. We hope to go forward with this research, into Phase 2 of the SBIR program, and on to the commercialization process beyond. The National Science Foundation deserves great credit for offering us this opportunity through SBIR, and we are grateful.

Steven Landau
Principal Investigator
Touch Graphics Company
New York, NY

Project Summary

The following paragraphs are taken from the SBIR Proposal submitted to the National Science Foundation in June of 2002

"This Phase 1 SBIR project will lead to the design, implementation and testing of a new approach to making public exhibit spaces, like science museums, more accessible to visitors who are blind, visually impaired, or otherwise print disabled. The system envisioned calls for a wireless network of user-activated audio beacons that can be triggered through a telephone interface. Visitors will navigate the exhibit space using cell phones, independently choosing which exhibit components to move to; when they reach a destination, they will listen to audio description of the relevant exhibit content, and trigger local events. On completing their museum visit, they will be asked to answer a series of survey questions, again using the phone, about their experiences in the museum that day. The hardware/software solution called for here relies on an innovative combination of existing, proven and cost-effective technologies. The work may lead to the introduction of a suite of products and services that could eventually be useful in a wide range of applications beyond the first target of making science museums more accessible.

"This proposal is being submitted as an *Information Based Technology*, under *subtopic E: Human/Computer Interactions*. The main purpose of the product that is the focus of this research is to increase exposure of individuals who are disabled to the enrichment, entertainment and education provided to the mainstream population at places like science and technology museums and centers. These facilities offer opportunities for informal science education that can inspire people to pursue careers in science and technology, and the Nation as a whole stands to benefit when more qualified young people are encouraged to enter these crucial fields. Furthermore, improved science literacy for all citizens, young or old, is an important goal that this work seeks to promote. The subtopic under which this proposal is submitted supports technologies that, "make people more productive by augmenting their capabilities through information devices." By adding to the public's awareness of science topics, the product to be developed here is responsive to these stated goals.

could be rapidly set up or dismantled. Since the units were battery powered, and received their triggering signals via radio, there was no external wiring. A telescoping antenna was used in cases where the FM reception was spotty.

- iv. *Economical.* The beacons had to be inexpensive, to stay within the project budget, and to create a product that could eventually succeed commercially. Many visitors carry their own cell phones, and given the continual reduction in cell phone usage charges, the costs to an institution may be limited to the beacons themselves, programming, and content development. This is in contrast to alternatives, such as existing hand-held audio players that represent a significant capital expense to museums. The costs for the *Ping* beacons that we built for the purposes of this experiment were as follows:

1. DTMF relay	\$30.00
2. Battery	\$ 8.00
3. Radio and accessories	\$12.00
4. Enclosure	\$3.00
5. Latches	\$4.00
6. Miscellaneous part and wiring	\$20.00
7. Assembly	\$50.00
Total	\$127.00

These prices reflect costs for single parts, because the quantities required for the Phase 1 research did not permit buying in bulk to achieve per unit discounts. We expect that at production-level quantities, the per-beacon cost could be reduced by 50%.

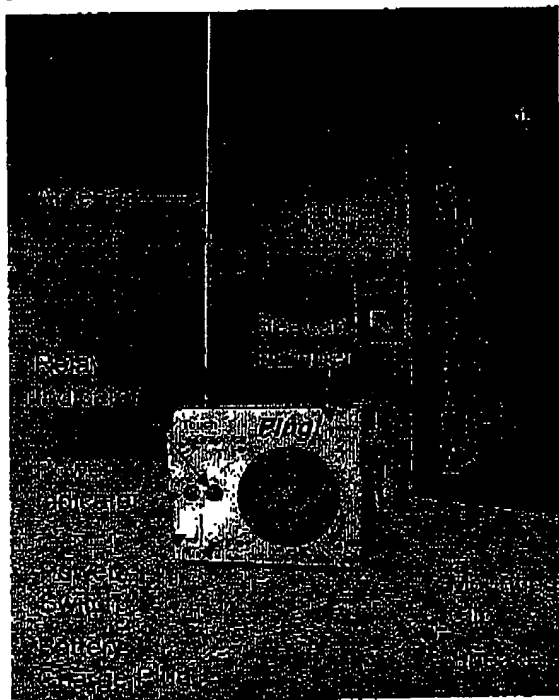


Figure 4: A wireless audio beacon with labels describing features visible on the face plate.

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